FY 2015 LDRD Projects

Division	Project Title	PI	Total Allocation
AT	Towards the Development of a Fiber Based Laser Plasma Accelerator (LPA) and Assessment of its Utility for Potential Biomedical Applications	Leemans,Wim P	$258,000
AT	Probing Point Defect Dynamics in Solids with Short Ion Beam Pulses	Schenkel,Thomas	$260,000
AT	High-Accuracy Scalable Solvers for Modeling of Future Ultrafast Photon Sources	Vay,Jean-Luc	$306,000
AT	A New Concept for High Average Power Ultrafast Lasers	Wilcox,Russell B	$416,000
AL	T-ReXS - Tender Resonant X-ray Scattering: A Spatio-Chemical Probe for Materials, Biology and Energy	Hexemer,Alexander	$260,000
AL	Ultra-high Resolution Microscopy of Nano-Materials by Scanning X-ray Diffraction Microscopy	Shapiro,David Alexander	$202,000
AL	Novel Accelerator Techniques for Diffraction Limited Light Sources	Steier,Christoph Andreas	$1,661,000
AL	High Efficiency Soft X-ray In-situ Spectroscopy (HESIS) for ALS-II Energy Sciences	Yang,Wanli	$180,000
CH	Probing Dynamics with Multi-Color, Multi-Pulse Laser and Synchrotron Photons	Ahmed,Musahid	$314,000
CH	Design of Mesoscale Catalyst Networks	Hartwig,John	$467,000
CH	#N/A Algorithms for Performing and Analyzing Large-Scale Electronic Structure Calculations	Head-Gordon,Martin	$290,000
CH	Designing Fluctuations and Dynamics of Enzyme Catalytic Networks	Head-Gordon,Teresa Lyn	$207,000
CH	Computational-Experimental Studies of Aerosol Transformations from the Liquid to Glassy State	Houle,Frances	$206,000
CR	High Performance Geometric Mulitgrid (HPGMG) For a #N/A TOP500 Computer Architecture Benchmark	Adams,Mark F.	$234,000
CR	Graph-Based Analysis and Visualization of Multimodal Multi-Resolution Large-Scale Neuroimaging Data	Buluc,Aydin	$460,000
CR	Unconstrained Functionals for Massively Parallel Scaling of Conjugate Gradient Eigensolvers	Canning,Andrew	$308,000
CR	Surrogate Model Algorithms for Optimization Problems	Bell,John	$228,000
CR	Advanced Computational Chemistry and Semantic Data Tools for Mesoscale Science	de Jong,Wibe Albert	$341,000
CR	Computational Approaches to Understanding Ultrafast Science	Kemper,Alexander Franciscus	$199,000
CR	Fast Numerical Methods for Green's Function in Mesoscale Simulation	Lin,Lin	$64,000
CR	EXDAC - EXtreme Data Analysis for Cosmology	Nugent,Peter E	$273,000
CR	High-Performance Parallel Analysis for Key Genomics Computations	Oliker,Leonid	$274,000
CR	High-Order Implicit Interface Methods for Complex Fluid Flow and Multiple Interface Dynamics	Saye,Robert	$223,000
CR	Coherent Information Propagation in Superconducting Qubit Trimers	Siddiqi,Irfan	$289,000
CR	SPOT Suite - Towards an End-to-End Solution for Light Source Data	Tull,Craig	$286,000
EE	Mesoscale Structuring of Surfaces for Energy and Water Applications	Anders,Andre	$133,000
EE	Next Generation Water Technologies for the Developing World	Buluswar,Shashi	$321,000
EE	IDEA--The International Database of Efficient Appliances: A #N/A Tool for Optimizing Energy-Efficiency	Gerke,Brian Francis	$134,000
EE	Application of Virtual Grind-Integration Laboratory (VirGIL)	Kiliccote,Sila	$387,000
EE	Using Differential Electrochemical Mass Spectrometry to Characterize Catalytic Processes in Li-Air Batteries	McCloskey,Bryan D.	$150,000
EE	Transforming the Electricity & Automotive Markets with the LBNL Vehicle-to-Grid Simulator (V2G-Sim)	Saxena,Samveg	$235,000
EE	Advanced Combustion Technology for Transportation Refrigeration Units	Therkelsen,Peter	$297,000
EE	Behavior Analytics	Todd,Annika	$311,000
EG	Novel Magnetic Field Mapping Technology For Small And Closed Aperture Undulators	Madur,Arnaud	$224,000
ES	The Soil Metazoan Microbiome: A Key Functional Compartment of Importance to Plant Health and Root C Stabilization	Ceja Navarro,Javier Arturo	$276,000
ES	Cracking the Earth: Thermal-Hydrological-Mechanical Modeling and Simulation of Fracture Propagation	Edmiston,John Kearney	$257,000
ES	Harnessing the Soil Microbiome for Food and Fuel Security	Brodie,Eoin L	$899,000
ES	Using Experiments and Numerical Models to Examine Ecosystem and Land Management Interactions with Atmosphere and Climate	Kueppers,Lara M.	$304,000
ES	Clay Interlayer Stratification: Implications for Ion Exchange and the Mobility of Neutral Molecules	Lammers,Laura Nielson	$149,000
ES	Fracture Characterization During and After Multistage Hydraulic Fracturing in Unconventional Gas Reserves Using Temperature Data	Mukhopadhyay,Sumit	$173,000
ES	Frequency-Modulated Hydraulic Fracturing for Secure and Efficient Reservoir Permeability Enhancement	Nakagawa,Seiji	$194,000
ES	Quantifying the Dynamics of Natural Organic Matter Conformation and Reactivity	Nico,Peter S	$242,000
ES	Extracting Natural Surfactant from Earth Sediments for Economical Oil/Gas Recovery (Re#N/Aal proposal	Wan,Jiamin	$193,000
GN	Discovery and Transfer of Novel Pathways for Phosphate Solubilization	Blow,Matthew James	$232,000
GN	Modification of the Genetic Code to Construct a Safe Industrial Microbe for Synthetic Biology	Cheng,Jan-Fang	$175,000
GN	Sequencing-Based Functional Genomic in-Vivo Characterization of Plant Promoters	Visel,Axel	$150,000
GN	Developing Epigenomic Technologies to Interrogate Genome Functions Relevant for Environment and Bioenergy	Wei,Chia-Lin	$163,000
GN	Tackling Microbial-Mediated Plant Carbon Decomposition Using Function-Driven Genomics	Woyke,Tanja	$178,000
GN	Development of a Cas9 Based Resource for Genome Engineering	Zhu,Yiwen	$314,000

AP	Neuro/Nano Technology for Brain Mapping	Denes,Peter	$725,000
LS	High-Performance Chemical Identification for Hyperspectral Data Science	Bowen,Ben	$306,000
LS	Microbiome Adaptation in Response to Environmental Challenges	Celniker,Susan E	$837,000
LS	4D Dynamics of Epigenome Regulation in Response to Environmental Challenges	Colmenares,Serafin U	$427,000
LS	A Graphene-Based Platform for Correlative Electron and Super-Resolution Microscopy	Xu,Ke	$151,000
LS	Reinventing Pre-Clinical and Environmental Testing Paradigms	Brown,James Bentley	$515,000
MS	Next Generation Neutrino and Rare -Event Detection	Asta,Mark	$102,000
MS	Search and Synthesis of the Next Generation of Topological Insulators	Analitis,James	$272,000
MS	Artificial Carboxysomes for CO2 Capture and Conversion in a Single Object	Buonsanti,Raffaella	$284,000
MS	Responsive Nanoparticle Assemblies	Helms,Brett A	$334,000
MS	Synthesis of Bio-Inspired Adaptive Membranes for Direct Capture of CO2 from Biogas	Lynd,Nathaniel Alexander	$166,000
MS	Understanding Radiation-Induced Photo-Electron Chemistry in High-Cross Section Organometallic Resist Materials	Naulleau,Patrick P	$309,000
MS	Computational Design of Smart Complex Oxides with Tunable Quantum Phases	Neaton,Jeffrey B	$329,000
MS	Dynamic Studies of Mesoscale Electronic Ordering in Complex Materials	Schoenlein,Robert William	$309,000
NE	Codesigning Big Iron for Big Data	Wright,Nicholas James	$386,000
NS	Toward Laser Spectroscopy of Transfermium Elements	Gates,Jacklyn M	$206,000
NS	Computational Nuclear Physics Code Developments for Fundamental Interactions/Astrophysics	Haxton,Wick C	$268,000
NS	Next-Generation Neutrino and Rare-Event Detection	Orebi Gann,Gabriel D	$217,000
NS	Next Generation Si-Based Tracking and Massive Online Data Processing for Collider Experiments	Ploskon,Mateusz Andrzej	$219,000
NS	Multi-Disciplinary Research to Enhance Understanding of Transport, Risks, and Mitigation of Radioisotopes for Improved Radiological Resilience	Vetter,Kai	$581,000
PB	Advanced Computational Tools for High Resolution Cryo-Electron Microscopy	Adams,Paul D	$274,000
PB	Probing Dynamics of Electron Transfer for Microbial-based Energy Interconversion	Ajo-Franklin,Caroline	$71,000
PB	Interfacing Chemical and Biological Catalysis for Solar-to-Fuel Conversion	Chang,Michelle	$200,000
PB	Functional Genomic Encyclopedia of Bacteria and Archaea: Evidence-Based Annotation of the Microbial Tree of Life	Deutschbauer,Adam M	$327,000
PB	Enhancing the Design-Build-Test-Learn Cycle for Metabolic Engineering	Hillson,Nathan J	$679,000
PB	Development of a CRISPR/Cas9 Knockout System for Streptomyces Venezuelae	Mukhopadhyay,Aindrila	$182,000
PH	Tactical High Throughput Computing: Improving Interdisciplinary Tools for High Throughput Computing	Bailey,Stephen	$154,000
PH	Higher Performance CCDs for Next Generation Dark Energy Experiments	Bebek,Christopher	$240,000
PH	Advanced Composites for Next Generation Scientific Instruments	Haber,Carl H	$399,000
PH	Searches for the Supersymmetric Particles at the LHC in Run-2 and Beyond	Heinemann,Beate H.E.	$275,000
PH	Next Generation Cosmic Microwave Background Detector Arrays: Enabling a factor 10-100 increase in Array Size	Lee,Adrian Tae-Jin	$258,000
PH	Confronting Beyond the Standard Model Theories with #N/A LHC and Astrophysical Data	Papucci,Michele	$249,000
SN	ESnet Network Operating System	Monga,Inder	$306,000